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ABSTRACT

A study tested the effects of hedges (which signal writers' tentative assessment of referential information) on readers' learning. Subjects, 145 ninth-grade students from three middle class junior high schools in a midwestern city who were ranked on the Iowa Test of Basic Skills, participated in the experiment--74 were randomly assigned to an experimental group and 71 to a control group. The text materials consisted of two passages of approximately 1,000 words written at a ninth-grade readability level taken from two textbooks, one from science and one from history. The hedges appeared in either personal or impersonal voice; in either the first half, second half or both halves of the passages; and in either a low intensity condition or a high intensity condition. A measure of what subjects learned from reading the passages showed that they learned most when the hedges appeared in personal voice, in the second half of a passage, and in low intensity. Findings suggest that the implications of this work can be extended to practices in composition classes--particularly practices of evaluating whether or not material should be hedged--in order to broaden students' critical-thinking abilities and their views of language. (Two tables of data are included, and 66 references are attached.) (NH)

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THE EFFECTS OF HEDGES ON READERS' LEARNING FROM PROSE

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ABSTRACT: Hedges, which signal writers' tentative assessments of referential information, were added to a passage from both a science and a social studies textbook. The hedges appeared in either personal or impersonal voice; in either the first half, second half, or both halves of the passages; and in either a low intensity condition or a high intensity condition. A measure of what subjects learned from reading the passages showed that they learned most when the hedges appeared in personal voice, the second half of a passage, and low intensity. Some extensions of the implications of this work to practices in composition classes--particularly practices of evaluating whether or not material should be hedged--are recommended in order to broaden students' critical-thinking abilities and their views of language.

INTRODUCTION

This paper focuses on the effects of hedges on readers. Hedges are linguistic elements like perhaps, might, to a certain extent, and it is possible that. In other published works, such elements are also occasionally called weakeners (Brown & Levinson, 1978), downtoners (Holmes, 1982; Quirk, Greenbaum, Leech, & Svartvik, 1972), detensifiers (Huebler, 1983), and understatements (Huebler, 1983). Whatever they are called, however, writers use them to signal a tentative or cautious assessment of the truth of referential information. In so doing, writers reduce the "degree of liability" or responsibility that they might face in expressing referential information (Huebler, 1983, p. 18).

Since hedges do not convey referential information but show an assessment of its truth value, they fulfill functions within what Halliday calls "the interpersonal semantic system of language." Options within the interpersonal system--as opposed to those within the ideational and textual systems--are concerned with "language as the mediator of role, including all that may be understood by the expression of our own personalities and personal feelings on the one hand, and forms of interaction and social interplay with other participants in the communication situation on the other hand" (Halliday, 1973, p. 58).

At first glance, hedges may not seem to fit perfectly within the interpersonal domain, but as Halliday shows, hedges are modality markers, and modality "is a form of participation by the speaker in the speech event. Through modality, the speaker associates with the thesis an indication of its status and validity in his own judgment; he intrudes, and takes up a position" (1970, p. 335). Since modality markers function interpersonally and not

referentially, they are often classified as non-topical material (Lautamatti, 1978, 1980) or as metadiscourse (Crismore, 1982, 1983, 1984a, 1984b, 1984c, 1985; Lindgren, 1982; Vande Kopple, 1985a, 1985b; and Williams, 1981, 1985).

STATEMENT OF THE PROBLEM

At this point, it would be difficult to use the literature on hedges to give writers advice about them. For there are almost as many bits of advice on hedges--and reasons for that advice--as there are writers on composition, style, and rhetoric.

For instance, some assert that writers should eliminate all hedges in their prose. Currently, this is probably the dominant message about hedges. And the main reason is that hedges add nothing to the referential information. Therefore, writers call them such things as "empty phrases" (Hacker, 1985, p. 93), "unnecessary words" (Yarber, 1985, p. 188), "deadwood" (Mahaney, 1985, p. 364), "throat-clearing" (Lindgren, 1982, p. 177), "padded expressions" (Muller, 1985, pp. 328-329), "circumlocutions" (Kirszner & Mandell, 1986, p. 185), "wasteful signposting" (Smith, 1985, p. 92), "clutter words" (Lannon, 1986, p. 135), and "empty qualifiers" (Millward, 1980, p. 205).

Other writers argue for the elimination of hedges by claiming that they rob prose of its certainty and power (Payne, 1975, p. 71; Zinsser, 1976, p. 96), that they reveal a writer avoiding commitments as well as difficult critical judgments (Rawlins, 1980). Such writers often call hedges "weak qualifiers" (Barnet & Stubbs, 1983, p. 355) or "the leeches that infest the pond of prose, sucking the blood of words" (Strunk & White, 1959, p. 59).

Another argument for the elimination of hedges is made by Shaughnessy. She notes that weaker writers often use hedges to start sentences and then lose their way as they get into the sentences. They forget what topic their

sentences are messages about and what parts of the sentence are supposed to agree with other parts. Thus they produce tangled sentences such as the following: "I think that a person who graduates from High School, is not necessary to get a degree" (cited in Shaughnessy, 1977, p. 62).

A second overall response to hedges is more positive. Writers in this camp take care to point out that hedges attached to statements of fact are unnecessary, but also that many statements do not express facts. Many statements express opinions, hypotheses, guesses, predictions, and the like. Thus such writers advise others to examine the nature of their material very carefully. If that material is debatable or not factual, then writers are usually well advised to hedge it (cf. de Beaugrande, 1985, p. 17; Dougherty, 1985, p. 186; Hairston, 1981, p. 54; Lannon, 1983, p. 135; Ruggiero, 1981, p. 227; and Woodman & Adler, 1985, p. 491). Those who give this advice note that good academic writing is dotted with hedges (Dillon, 1981, p. 91), that much student writing "stands in need of a delicate qualifier here or there rather than the removal of them" (Dillon, 1981, p. 91), and that hedges can "keep prose responsible" (Packer & Timpane, 1986, p. 220).

Finally, a third overall response to hedges is even more favorable. It stresses the benefits of using hedges and calls for writers to be alert for chances to use them. For example, Singer (1986) includes hedges among the elements that help make a text "friendly." Nadeau addresses primarily speakers, but perhaps his point can be extended to writers as well: "No one knows everything and no one can avoid mistakes. The sensitive speaker quickly learns, strangely enough, that it is possible to be more accurate by simply being less positive. He protects himself by using self-qualifiers like <u>it seems to me</u>, <u>in my opinion</u>. . ." (1973, pp. 100-101). Laib suggests that an effaced, hedged style may offer other advantages: "Statesmen and teachers may

prove more effective with a degree of effacement, since it leaves room for discussion, differences of opinion, and compromise" (1985, p. 590). And in a remark related to this kind of advice, Kress and Hodge suggest that hedges and other modality markers may convey the "major content of an utterance" (cited in Ruthrof, 1981, p. 196).

Obviously, there is a wide range of advice about hedges. Indeed, some bits of advice are polar opposities of other bits, leaving learners with contradictory messages about if and when to use hedges.

To date, no body of empirical work helps resolve this dilemma. Meyer and her associates examined the correlations between some kinds of metadiscourse (text connectives and illocution markers) and "the ability to recall content for readers at both ends of the proficiency scale, i.e. those who scored quite high or quite low on standardized reading tests (notably the Stanford Achievement Test)" (1982, p. 45). However, they did not extend such tests to the effects of hedges.

Vande Kopple (1985b) investigated how well readers recalled modality markers as well as the referential material to which the modality markers were attached, although the modality markers he used were not hedges but emphatics. These are elements like it is certainly the case that, showing not a weaker but a stronger commitment to the truth or probability of referential material. He found that readers did not recall the emphatics well and that they led to slightly poorer recall of the referential material to which they were attached than did sentences without emphatics.

Finally, Crismore (1984c) added both hedges and emphatics to social studies passages in order to investigate whether readers recalled the modality markers and the referential material. She also investigated whether adding hedges and emphatics made a difference in readers' attitudes toward the

referential material. She found that hedges and emphatics facilitated the learning of students who were not anxious about reading social studies material, but detrimentally affected the learning and attitudes of students who were highly anxious. Moreover, on some subtests, hedges and emphatics increased the learning of high-ability students but not that of low-ability students. But the role of hedges was not separated from that of emphatics.

Therefore, to begin gathering data that would guide teachers in advising students about hedges, an experiment was designed and conducted to explore how hedges affect readers' learning. In this study, "learning" was operationally defined as the difference between scores on pre- and post-reading retention tests for referential information.

METHOD

Subjects

The participants in this study were ninth-grade students from three middle class junior high schools in a fairly large midwestern city. They were average students as revealed by their composite scores on the Iowa Test of Basic Skills (Median = 295.50). In the spring of the school year, students were randomly assigned to either experimental (N=74) or control conditions (N=71). All data were gathered across a two-week period in regular classrooms.

Text Materials

The text materials for this study consisted of two passages. Each of these contained approximately 1,000 words, was written at a ninth-grade readability level, and addressed a topic that is enveloped in controversy in our culture. Controversial topics are especially suitable to studies such as this since they can naturally contain modality markers; in fact, both passages used in this study originally contained hedges, most of which took the form of

modal verbs (may, might). To construct passages for the control subjects, all hedges were removed, resulting in a "factual" passage.

One of the two passages was taken from a science textbook, Ginn Science Program: Advanced Level B (Assimov and Gallant, 1975). This passage centered on the theory of primate development. The other passage came from a social studies textbook, The Pageant of American History (Leinvard, 1975). This passage addressed the topic of basic values in American society, with the first half focusing on change and progress, and the second half focusing on the women's liberation movement.

Science and social studies texts were chosen because they are a main part of ninth graders' schoolwork, because they represent disciplines with different systems of belief, inquiry, and discourse (Tornebohm, 1973), and because some of the material naturally contains hedges. In addition, students typically approach texts from different disciplines differently, depending on a host of individual difference factors (e.g., gender, prior knowledge, beliefs, attitudes, interest, and anxiety) (Anderson, Pichert, & Shirey, 1983; Hill, 1980; Spiro & Myers, 1984; Spiro & Tirre, 1980).

Basically, these two passages were manipulated by having certain kinds of hedges added to them. The hedges appeared in the form of full clauses added to the beginning of targeted sentences. Thus, the clauses expressing the hedges became main clauses while the original targeted sentences became main-clause complements (i.e., subordinate that clauses). For example, in one condition the clause It seems to me that was added to the sentence Scientists can explain the biological change that took place in primates on the basis of the evidence. As often as possible, an attempt was made to target sentences that were hedged in some way in the original passage.

Hedging clauses were presented in several different ways: (1) in either personal or impersonal voice; (2) in only the first half of the passages, only the second half of the passages, or throughout both halves of the passages; and (3) with low or high intensity.

Hedges presented in personal voice contained personal pronouns (I, to me, for me), and those presented in impersonal voice contained the third person pronoun it. Table 1 presents the hedges in personal and impersonal voice. Among the eight hedges in personal voice, to me occurs twice (clause internal), for me occurs twice (clause initial), and I occurs four times (clause initial). Among the eight hedges in impersonal voice, it (clause initial) occurs each time. Also, four of these impersonal constructions include passive transitive verbs, and the other four include intransitive verbs.

Table 1

The Hedge Constructions Used

	Personal Voice	Impersonal Voice
1.	It seems to me that	It seems that
2.	For me it is conceivable that	It is conceivable that
3.	I presume that	It is presumed that
4.	It appears to me that	It appears that
5.	I theorize that	It is theorized that
6.	For me it is possible that	It is possible that
7.	I suppose that	It is supposed that
8.	I hypothesize that	It is hypothesized that

When hedges were presented in the low-intensity condition for one half of a passage, five of them appeared. Thus, one passage would have hedges in low intensity in its first half, and another passage would have hedges in low intensity in its second half. The five hedged sentences were fairly evenly distributed throughout one or the other half of the passage with three of the five hedged clauses introducing the first sentence of a paragraph, and two introducing sentences internal to paragraphs. When hedges were presented in

the low-intensity condition for the entire passage, one set of five hedges mentioned above in either personal or impersonal voice would be used twice (once for each half of the passage), producing a total of ten hedges in the passage.

On the other hand, when hedges were presented in the high-intensity condition for one half of a passage, three hedges in addition to the five mentioned above were added. They were added to consecutive sentences near the middle of one half of a passage. Thus, one passage would have eight hedges in its first half, and another passage would have eight in its second half. When hedges were presented in the high-intensity condition for the entire passage, one set of eight hedges would be expressed twice, producing a total of sixteen hedges in the passage. The hedge constructions used for the low-intensity and high-intensity conditions are shown in Table 2.

Table 2

Hedges Used for Low Intensity and High Intensity

LOW INTENSITY

	Personal Voice	Impersonal Voice
1.	It seems to me that	It seems that
2.	For me it is conceivable that	It is conceivable that
3.	I presume that	It is presumed that
4.	It appears to me that	It appears that
5.	I theorize that	It is theorized that

HIGH INTENSITY

(the preceding 5 hedges with the following 3 hedges added)

6.	For me it is possible that	It is possible that
7.	I suppose that	It is supposed that
8.	I hypothesize that	It is hypothesized that

Further, when hedges were presented in the high-intensity condition for one-half of a passage, four of the eight hedges were attached to sentences that

adult expert readers had judged as expressing ideas essential for understanding the passage; these sentences were labelled "central-idea sentences." The other four hedges in one-half of a passage were attached to sentences that the same readers had judged as expressing ideas somewhat peripheral to the gist of the passage; these sentences were labelled "peripheral-idea sentences." Examples of central-idea and peripheral-idea sentences are presented in Table 3.

Table 3

Examples of Manipulated Central-Idea and Peripheral-Idea Sentences

Central Ideas

(Science) It seems that if a ground-ape could stand on his hind legs, he would have an advantage.
(Science) It appears to me that the key to their survival was the ability to change eating habits.
(Social Studies) I theorize that equality will have to be supported and tested by the courts, by all levels of government, and by men as well as women.
(Social Studies) It seems to me that with the beginning of the Industrial Revolution, it became common to regard all change as change for the better, or progress.

Peripheral Ideas

(Science) I theorize that when they came to the other patch of forest, they might have found apes in possession of that territory.
(Science) It is conceivable that somewhere in the rocks there exist fossils of the tree-living apes of that period of increasing dryness.
(Social Studies) I hypothesize that it is not progress to go even faster.
(Social Studies) It is possible that the air in the upper atmosphere is disturbed with severe and uncertain consequences.

Variables Manipulated

In sum, then, the two original textbook passages were manipulated through the addition of full-clause hedges to targeted sentences identified as either central-idea or peripheral-idea sentences. These hedges varied in voice, location, and intensity. The hedges appeared in either personal or impersonal voice. They appeared in either the first half of the passage, the second half of the passage, or throughout the passage. And they appeared in lov intensity

(5 hedges per half, 10 for the entire passage) or in high intensity (8 hedges per half, 16 for the entire passage).

Pretests and Posttests

Ability Measure. In order to determine whether experimental subjects differed in ability from control subjects, the Wide Range Vocabulary Test (WRAT) (ETS, 1962) was given as a measure of students' general ability. Analysis of the WRAT scores revealed no significant differences between control and experimental science subjects, $t=1.64$, $p > .105$ (control $M=89.51$, $S.D.=52.17$; experimental $M=107.77$, $S.D.=58.49$). Analysis also revealed no significant differences between control and experimental social studies subjects, $t= -1.28$, $p > .205$ (control $M=92.22$, $S.D.=55.11$; experimental $M=106.80$, $S.D.=58.02$).

Retention Tests. Two cognitive measures, the Science Retention Test (SRT) and the Social Studies Retention Test (SSRT), were developed for the science and social studies passages. Multiple-choice tests with four alternatives were designed to measure students' retention of ideas previously identified as either central or peripheral. Each retention test consisted of 16 questions, 8 assessing recall of central ideas, and 8 assessing recall of peripheral ideas. For students in the experimental conditions, 8 questions focused on ideas in sentences with hedges attached, and 8 focused on ideas in sentences without hedges. For students in the control condition, all sixteen questions assessed recall of ideas in sentences without hedges. Examples of questions on central-idea sentences and on peripheral-idea sentences are shown in Table 4.

Table 4

Examples of Questions Based on Manipulated Central-Idea and Peripheral-Idea Sentences

Central Ideas

(Science) The apes comprising the "missing link" are those
- a. that lived in trees during the time of less and less moisture.
- b. that never learned to use sticks as tools.
- c. without hemoglobin in the blood.
- d. that never lived in trees.

(Social Studies) Considering all change as change for the better became common with the beginning of
- a. the Agricultural Revolution.
- b. greater yields per acre of croplands.
- c. flights from New York to Paris.
- d. the Industrial Revolution.

Peripheral Ideas

(Science) When wandering apes came to a new patch of forest, they probably found
- a. others of their kind living there.
- b. many healthy trees.
- c. adequate water supplies.
- d. dying apes.

(Social Studies) We probably cannot consider it progress when we
- a. produce bigger products than anyone else.
- b. resist the burden of grinding toil.
- c. feed more of the hungry than anyone else.
- d. spend more money on building more advanced missiles.

Therefore, each retention test consisted of one 8-item subtest for central ideas and one 8-item subtest for peripheral ideas. These central-idea and peripheral-idea subtests were then further subdivided. The 8 items on each subtest were divided equally into items assessing statements with and without hedges. The six subtests, then, included Central Ideas, Central Ideas With Hedges, Central Ideas Without Hedges, Peripheral Ideas, Peripheral Ideas With Hedges, and Peripheral Ideas Without Hedges.

Design

The design for the experimental group was a 2 (personal, impersonal voice), X 2 (low, high intensity), X 3 (first half, second half, both halves location) factorial design. Each student was randomly assigned to a particular experimental condition or assigned to a control group. Students who read science and social studies passages with hedges read them in the same condition but in counterbalanced order.

Procedure

The following pretests were given to students on the first day of testing:

1. Wide Range Vocabulary Test (WRAT)
2. Science and Social Studies Retention Tests (SRT; SSRT).

On another day, approximately one week later, students read either a science passage or a social studies passage, those in the experimental conditions with hedges, and those in the control group without hedges. After reading a passage, students were given the appropriate posttest for retention.

Retention Test Analyses

The between-subject factors for the analyses of the retention tests were personal voice versus impersonal voice, first half versus second half versus both halves location, and low versus high intensity. To provide a measure of how much students learned from reading science and social studies passages, a difference score (i.e. learning gain) was calculated from the pre- and post-Science Retention Test scores and Social Studies Retention Test scores. For both difference scores, separate three-way and one-way analyses of variance were performed on the total tests and on the six subtests. This approach was used because questions in some subtests assessed targeted sentences with hedges

attached while others did not, and also because subtests consisted of questions assessing either central or peripheral ideas.

DESCRIPTIVE RESULTS

A remarkably consistent pattern of results emerged. Table 5 shows the results for the total retention test difference scores (i.e., learning gains) listed in rank order. The ranked difference scores indicate that those students who made the greatest learning gains from reading science and social studies passages with hedges were those who encountered hedges in personal voice, the second half of the passages, and low intensity.

In the case of both the science and the social studies passages, the students in the condition combining all three variables--personal voice, second half location, and low intensity--made the greatest learning gains. And when the means were ranked for both passages, these students were followed by those in a condition with the second-half variable, then by those in a condition with the low-intensity variable, and then by those in a condition with the personal-voice variable. In Table 5, the results for several other conditions appear, revealing an order that holds for both passages. At the bottom of Part I of the table appear the results for those students in the condition combining the three variables that can be viewed as stark contrasts to the three variables producing the greatest learning gains: impersonal rather than personal voice, both halves rather than second half location, and high rather than low intensity. Clearly, the combined impersonal voice, both halves location, and high intensity variables produced the smallest learning gains for both science and social studies.

Table 5

Ranked Means and Standard Deviations for the Total Retention Test Difference Scores

Groups/Variable	N	Science	N	Social Studies
I. Experimental Groups				
Combined Variables: Personal Voice, Second Half Location, Low Intensity	8	6.63 (3.42)	6	4.17 (2.48)
Second Half Location	26	5.54 (3.22)	25	4.12 (3.31)
Low Intensity	37	4.81 (3.13)	37	3.77 (3.68)
Personal Voice	37	4.70 (3.00)	37	3.49 (3.49)
Total Population	74	4.09 (3.32)	74	3.28 (3.37)
First Half Location	26	3.69 (3.08)	25	3.12 (3.06)
Impersonal Voice	37	3.49 (3.31)	37	3.08 (3.74)
High Intensity	37	3.37 (3.15)	37	2.85 (3.05)
Both Halves Location	22	2.86 (2.75)	24	2.58 (3.68)
Combined Variables: Impersonal Voice, Both Halves Location, High Intensity	6	1.33 (3.39)	6	1.33 (4.13)
II. Control Group	35	4.77 (2.65)	36	3.97 (3.29)

Results for ANOVAs

As noted earlier, separate 2 x 2 x 3 analyses of variance (voice x location x intensity) with the difference scores on the science and social studies retention test as the dependent measure were performed for the Total Test and the six subtests (Central Ideas, Central Ideas with Hedges, Central Ideas without Hedges, Peripheral Ideas, Peripheral Ideas with Hedges, and Peripheral Ideas without Hedges). The results of these analyses are displayed in Table 6.

Three-way ANOVA Science Results. As Table 6(IA) shows, several significant main effects were found for the location variable. For the total test, students in the second half location group learned more than those in the first half location group and those in the both halves location group. The pattern of results was the same for the Central Ideas With Hedges and Peripheral Ideas subtests. Although the results for the intensity variable were not significant, the difference scores (i.e. learning gains) for students in the low intensity group were higher than those for students in the high intensity group. Although the analysis showed no significnt main effects for voice, students in the personal voice group learned more on the Total Test than those in the impersonal voice group. No significant two-way or three-way interactions were found.

One-way ANOVA Science Results. The one-way ANOVA results shown in Table 6(IC) revealed a significant difference between the scores of the low intensity group and the scores of the high intensity group for the Total Test. Students in the low intensity group learned more than those in the high intensity group. Significant results were also found between the first half location group and second half location group for the Total Test and for the Peripheral Ideas subtest. For both tests students in the second half location condition remembered more than those in the first half location. Significant differences

were also found between the second half location group and the both halves location group for the Total Test, Central Ideas with Hedges, Peripheral Ideas, and Peripheral Ideas without Hedges subtests. Again, students in the second half location group remembered more than those in the both halves location group. No significant results were found for the voice variable.

Three-way ANOVA Social Studies Results. No significant main effects were found for the Total Test or the six subtests, but as the means shown in Table 6(II) indicate, the pattern of results for the Total Test was the same as that for science. Although the analyses showed no significant main effects for social studies, they did reveal several significant interactions, which are displayed in table 6(IB). Significant two-way voice x location interactions were found for the Total Test and for Peripheral Ideas with Hedges. In addition, significant two-way interactions were also found for intensity x location for Peripheral Ideas with Hedges and for intensity x voice for Central Ideas without Hedges. Finally, a significant three-way interaction was found for Central Ideas with Hedges.

One-way ANOVA Results. The findings from the one-way analysis of variance performed on the Total Test and six subtests showed no significant results for any variable.

Table 6

I. Results for Retention Test Difference Scores
Significant ANOVA Results

A. Main Effects from Three-Way ANOVA on Science

Variables and Tests	DF	F Value	P Value
Location			
Total Test	2,70	4.33	.017**
Central Ideas with Hedges	2,70	3.74	.029**
Peripheral Ideas	2,70	3.30	.044**

B. Interaction Effects from Three-Way ANOVA on Social Studies

Variables and Tests	DF	F Value	P Value
Voice X Location			
Total Test	2,70	4.04	.022**
Peripheral Ideas	2,70	3.06	.024**
Peripheral Ideas with Hedges	2,70	1.29	.018**
Intensity X Location			
Peripheral Ideas with Hedges	2,70	5.18	.008***
Intensity X Voice			
Central Ideas without Hedges	1,70	4.09	.048**
Voice X Intensity X Location			
Central Ideas with Hedges	2,70	3.11	.052*

C. One-Way ANOVA on Science

Variables and Tests	DF	T Value	P Value
First Half/Second Half Location			
Total Test	49.91	2.11	.040**
Peripheral Ideas	49.84	2.57	.013**
Second Half/Both Halves Location			
Total Test	45.99	3.11	.003***
Central Ideas	45.00	2.12	.040**
Central Ideas with Hedges	45.65	3.00	.004***
Peripheral Ideas	41.15	2.54	.015**
Peripheral Ideas without Hedges	44.67	2.59	.013**
Low/High Intensity			
Total Test	72.00	1.96	.053*

*=p<.10
**=p<.05
***=p<.01

Table 6

II. Means and Standard Deviations for the Total Scores of Science and Social Studies

	Science		Social Studies	
Variables	means	S.D.	means	S.D.
Location				
First Half	3.69	3.08	3.06	3.06
Second Half	5.54	3.22	4.12	3.31
Both Halves	2.86	2.75	2.58	3.68
Intensity				
Low	4.81	3.13	3.77	3.68
High	3.37	3.37	2.85	3.05
Voice				
Personal	4.70	2.99	3.49	3.00
Impersonal	3.49	3.31	3.08	3.08

DISCUSSION

This study has some limitations. Only one text from each of two disciplines was used. Only ninth-graders read and reacted to the passages, and all of them reacted immediately after reading the passages. Additionally, all of the hedges appeared in the form of full clauses. And as we noted earlier, analysis of variance revealed some interactions in the social studies results that will have to be examined more closely in the future.

Therefore, any broad and firm generalizations about the effects of hedges will have to wait upon additional research with more kinds of texts, with more kinds of readers, with texts having different numbers and kinds of hedges, and with longer intervals between reading sessions and retention tests.

However, the experimental results reported here allow us to begin formulating a position on the uses of hedges. The result we wish to focus on is that in the case of the total retention test for both the science and the social studies passages, the subjects who made the greatest learning gains were not the control subjects, those who read the passages without hedges. Rather,

they were those who read passages with hedges--and more specifically with hedges in personal voice, in the second half of the passage, and in lov intensity.

Moreover, as Table 5 shovs, for both passages other experimental groups also made greater learning gains than did the control subjects. And these groups read passages that were marked by one or another of the three hedge variables named above: personal voice, second-half location, and lov intensity.

Of course, hov much readers learn from an informative passage is not the only issue for giving advice about writing. For instance, hov the passage affects readers' emotions, attitudes, and ideologies should be considered, and ve plan to do so in future research. But how much readers learn from an informative passage is certainly an important (perhaps the most important) concern for such passages.

Therefore, simply advising vriters to avoid all hedges in informative material is probably unvise. After all, if hedges vere indeed "deadvood," "clutter vords," "padded expressions," or "vasteful signposting," they should distract or impede readers and thereby reduce the amount learned from a passage. Similarly, if hedges rob prose of its certainty and pover, they should keep readers from taking passages altogether seriously, again reducing the amount learned. But in our study hedges expressed in personal voice, the second half of a passage, and lov intensity actually increased the amount.

On the other side, the experimental results reported here do not provide direct evidence that hedges can encourage discussion and compromise, or that they can constitute the major content of a passage. Though these claims might be true, our tests vere not directly relevant to them.

Therefore, it is probably wisest to advise that writers should determine whether or not material should be hedged and, if so, they should hedge it in personal voice, toward the end, and relatively lightly. If writers follow this advice, this experiment indicates that they will lead readers to make greater learning gains.

Our experimental results do not of course justify advising writers to add hedges to everything they write. Both of our test passages conveyed information that is enveloped in heated controversy in our culture. Such material should be hedged, but not all. Empirical facts and material supported by socio-cultural consensus should stand on their own. However, much of what people may assume are facts are rather judgments, hypotheses, predictions, or guesses. To be honest in conveying them, writers should hedge them.

Booth (1974) has pointed out that our culture tends to value objectivism and to dismiss--as mere belief without value--everything that is not verifiable fact. This tendency probably accounts for the treatment of beliefs, theories, and judgments as facts, even in fields like history and science, in which not all writing is factual. Henry Steele Commager comments on the work and discourse of history:

> Let us admit at once that history is neither scientific nor mechanical, that the historian is human, and therefore fallible, and that the ideal history, completely objective and dispassionate, is an illusion. There is bias in the choice of a subject, bias in the selection of material, bias in organization and presentation, and inevitably bias in interpretation. (1966, p. 53)

H. Giroux comments on the writing in social studies curricula:

> . . . the normative nature of the material selected is presented as both unproblematic and value free. In the name of objectivity, a large part of our social studies curricula universalizes dominant norms, values, and perspectives that represent interpretive and normative perspectives on social reality. (1978, p. 297)

Such practices, Giroux goes on to add, make it difficult for students to develop the critical abilities necessary to distinguish facts from judgments and interpretations.

Similar claims can be made about the processes of and reports about scientific activity:

> I am, as several other essays emphasize, an advocate of the position that science is not an objective, truth-directed machine, but a quintessentially human activity, affected by passions, hopes, and cultural biases. Cultural traditions of thought strongly influence scientific theories, often directing lines of speculation, especially . . . when virtually no data exist to constrain either imagination or prejudice. (Gould, 1980, p. 225)

Thus, to do justice to the nature of perhaps more material than we would ordinarily suppose, writers should hedge it in ways that are consistent with the experimental results reported here.

To explain fully and specifically why hedges in personal voice, the second half of a passage, and low intensity led to the greatest learning gains would entail additional research. We can, however, begin to speculate about the reasons for the advantages of these variables.

Consider the personal voice variable. Hedges in personal voice, as opposed to those in impersonal voice, would clearly mark a claim as an expression of one person's opinion ("It seems to me that"; "I theorize that"). There might be some appeal for students in the openness and honesty of such an attitude. Moreover, the personal voice could have aided retention and learning by bringing a concrete (even imaginable) presence into the text. Collins (1986) has found that first-person pronouns can increase the solidarity between writers and readers. And as we noted above, Halliday (1985) shows that modality is an inherently personal part of language. Therefore, modality markers in personal voice are probably close to congruence with the realities of language.

The finding that hedges in the second half of a passage conveying controversial material aided learning most might mean that in that half the elements of the controversy would become clearest to readers. Readers would be able to attain a complete view of the controversy, make full sense of explicit claims, and understand the significance of implications. If readers respond positively to the openness and honesty of the practice of hedging controversial material, they probably respond most positively when all the implications of the controversy are clearest--toward the end.

Finally, we can turn to the finding that hedges in low intensity, not high, led to the best results. Of course, each hedged sentence is longer than its non-hedged counterpart, giving passages with hedges in high intensity more words. Moreover, each hedged sentence is more syntactically complex and delays the introduction of its sentence topic longer. Thus the extra three hedges in the high intensity conditions could have impeded efficient processing through the additional words, the syntactic complexity, and the delays of sentence topics.

Apparently, then, if full-clause hedges are to be used in a text, they should be used lightly. This is consistent with the advice de Beaugrande (1985) gives about how often to hedge those statements that do need it. Perhaps fewer hedges than the five used in the low-intensity conditions would have produced the same positive results, particularly if one or two appeared near the heart of the controversial material. This is another area for future research.

Writers who receive, discuss, and work with such advice should benefit in several other ways. If writing teachers and students interact in establishing methods to examine the truth status of referential information, in thinking about readers' probable reactions to it, and in discussing if, when, and how the information should be hedged, the students might attain benefits beyond producing essays that readers will learn from well. For instance, students might become more inclined to examine and evaluate the sources and status of the information they present--who said or wrote something, how they came up with it, in what framework they operate, and for what purpose they use the information.

If so, students might develop more respect for and commitment to the processes of research and documentation, seeing them not simply as dreaded chores, but as the responsibility of all conscientious researchers.

Furthermore, such activities and concerns might lead students to cultivate a better tone in their writing instead of being dogmatic, even tendentious, as if the more strongly a claim is made, the more likely readers are to accept it. Bolinger points out how hedging certain bits of information can add "a measure of honesty about how reliable the information is" (1982, p. 322). Therefore, we agree with Dillon's statement that student writing often needs a delicate qualifier (1981, p. 91).

But even more fundamentally, students might develop their ability to think critically. Reviewing, analyzing, and deciding what counts as valid evidence

and lines of reasoning are all integral sub-processes of the larger process of critical thinking.

Moreover, writing students might develop a fuller and more accurate view of language. At present teachers and students think about and work with language for conveying bits of referential information much more than with language for establishing and maintaining interpersonal relationships, and interacting with and about referential information. Ruthrof would account for this by citing our culture's "habitual emphasis on the propositional and referential side of language" (1981, p. 194). Also, the dominant way in which discourse in classrooms and textbooks is probably thought about by both teachers and students is constrained by the conduit metaphor (see Reddy, 1979): "The speaker puts ideas (objects) into words (containers) and sends them (along a conduit) to a hearer who takes the idea/objects out of the word/containers" (Lakoff & Johnson, 1980, p. 10). As a result, English has dozens of expressions related to the process of packing ideas into containers and sending them to receivers, for example, "It's hard to put this idea into words," "It's difficult to get this thought across to him," or "Try to pack more thoughts into fewer words." We can well understand, therefore, why the language used in educational settings has been viewed primarily as the vehicle for the "transmission of knowledge and value by those who knew more to those who knew less. . . " (Bruner, 1986, p. 150).

We should give more thought to an interactionist model of language focused on people's claiming of meaning through language, their interacting with others in complex contexts about meaning, and their continual constituting of themselves, of their hearers or readers, of their language, and of their culture through language (cf. Ruthrof, 1981; Smith, 1978, p. 83; and White, 1984, p. 6). Here, language is never considered perspective-free, even at the level of an

individual clause, where particular purposes and perspectives on the world influence hov the topic and the comment of the clause are chosen. Different people could viev the same event, state, or action and formulate different descriptive clauses about it by focusing in different vays.

If educators, textbook vriters, and students vere to follov the interactionist model and not the conduit metaphor vhen using language, the processes of schooling vould be much more exciting. Students could be actively involved in the analysis, evaluation, and creation of perspectives on the world. Such activities, Bruner (1986) notes, lead to engagement, to curiosity, to vonder, as vell as to a healthy humility in forcing speakers and vriters to acknovledge the presence of other perspectives just as valid as their ovn (cf. White, 1984).

At the same time, if more researchers vieved language as a form of interaction, they vould have to devise different experimental instruments and materials instead of those geared to determine only hov many bits of information readers can "unpack" from vords, clauses, and texts.

Even if the activities that ve recommend--evaluating the sources, truth values, and probable effects of bodies of information--do not lead immediately to better critical thinking in students and to nev models of and practices vith language for students and teachers, ve vould be taking significant steps in the right direction.

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